AMENDMENTS TO THE CLAIMS:

1. (Currently Amended): A method for making a coordinated and complementary set of holograms comprising at least one hologram, to be used in a system for recording and projectingprojection of three-dimensional images in substantially 3-dimensional format, wherein said three-dimensional images are magnified uniformly in all dimensions by a magnification factor, said method comprising the steps of:

producing athe recording reference beam by passing diffuse coherent light from a coherent light sourcelaser through a first active optical arraysystem containing a plurality of image focusing means therein; and

producing anthe object beam by passing diffuse coherent light from the same coherent light sourcelaser through a second active optical arraysystem containing a plurality of image focusing means therein of the same number and arrangement as the first active optical arraysystem, the F-number of each said focusing means of the second active optical system being the same as the F-number of the first active optical system, and each said focusing means of the first optical system,

a) wherein the distances between the centers of all of the focusing means of the second optical array are a multiple of the distances between the corresponding focusing means of the first optical array, said multiple being equal to the magnification factor; and,

b) wherein the focal lengths of the focusing means of the second optical array are the same multiple of the focal lengths of the corresponding focusing means of the first optical arraycomponent parts of an equation used for determining the F-number of the second optical system are substantially the same multiples of all of the component parts used for determining the F-number of the first active

~~optical system, respectively, said multiple being equal to the expected magnification of the 3-dimensional image~~.

2. (Currently Amended): The~~A~~ method of~~according to~~ claim 40 wherein a movable aperture is applied~~made a part of~~ each of said two ~~active~~ optical arrays~~systems~~ such that the size and shape of the aperture of the first ~~active~~ optical defines each~~system is the same as an~~ elemental image of an~~the~~ unmagnified integral photograph and the size and shape of said aperture of the second ~~active~~ optical array~~system~~ defines each~~is the same as an~~ elemental image of the ~~magnified~~ integral photograph magnified, said movable aperture being placed between a~~the~~ diffuser plate and each of the image focusing means contained in the ~~active~~ optical array~~system~~ and adjacent to the surface of the diffuser plate, ~~and~~ said method comprising ~~the steps of~~:

a) positioning said movable aperture in the first ~~active~~ optical array~~system~~ so that it coincides with the position of a~~the~~ first of the elemental images of the unmagnified integral photograph; and,

b) positioning said movable aperture in the second ~~active~~ optical array~~system~~ so that it coincides with the position of a corresponding~~the~~ first of the elemental images of the magnified integral photograph; and,

c) producing a recording~~the~~ reference beam by passing diffuse coherent light from a coherent light source~~laser~~ through the first ~~active~~ optical array~~system~~; and,

d) producing a recording~~the~~ object beam by passing diffuse coherent light from the same coherent light source~~laser~~ through the second ~~active~~ optical array~~system~~; and,

e) allowing the reference and object beams to impinge upon a~~the~~ photographic plate for a sufficient time to expose the hologram; and,

f) thereafter, positioning said movable aperture in the first ~~active~~ optical array~~system~~ so that it coincides with the positions of the

second of the elemental images of the unmagnified integral photograph, the third of the elemental images of the unmagnified integral photograph, the fourth of the elemental images of the unmagnified integral photograph, and so on, each positioning of the aperture comprising a step in the process; and,

g) at the same time, positioning said movable aperture in the second ~~active~~ optical arraysystem so that it coincides with the positions of the second of the elemental images of the magnified integral photograph, the third of the elemental images of the magnified integral photograph, the fourth of the elemental images of the magnified integral photograph, and so on, each positioning of said aperture comprising a corresponding simultaneous step in the process; and,

h) for each corresponding step, producing~~produce~~ the reference and object beams and in the same manner as they were produced for the first elemental position; and,

i) for each corresponding step, exposing~~expose~~ the same photographic plate~~hologram~~ in the same manner as it was in the previous steps~~, making sure that both apertures always move together~~.

3. (Currently Amended): The~~A~~ method of~~according to~~ claim 2 wherein short bursts of low intensity laser radiation are used as the source of coherent light for exposure of the hologram.

4. (Currently Amended): The~~A~~ method of~~according to~~ claim 2 wherein a third movable aperture is placed in contact with the emulsion of the photographic plate that is to become the hologram and wherein a fourth movable aperture is placed on the opposite side of the photographic plate that is to become the hologram, so that ~~the~~ both the third and fourth apertures are always positioned coincidentally so as to permit the maximum amount of light to pass through the photographic plate, and wherein the third and fourth apertures move together with the first and

second apertures in such a manner as to ~~only~~ expose, one at a time, each~~an~~ element of the coordinated and complementary set of hologramshologram, ~~said elemental position corresponding with the positions of the first and second apertures that also always move together~~.

5. (Currently Amended): The~~A~~ method of~~according to~~ claim 2, further comprising reversing each of the elemental images and retaining the original order and arrangement of the elemental images ~~wherein optics to produce a mirror image of each of the elemental images of the integral photograph to be magnified is used in preparing the hologram so that when the magnified integral photograph is produced each elemental image of the magnified integral photograph is the mirror image of its corresponding elemental image of the unmagnified integral photograph but the spatial arrangement of the elemental images of both the unmagnified and magnified integral photographs is the same~~.

6. (Currently Amended): The~~A~~ method of~~according to~~ claim 5 wherein the magnification factor is unity.

7. (Currently Amended): The~~A~~ method of~~according to~~ claim 5 wherein the order of the elemental images is reversed~~wherein optics to produce the elemental images of the integral photograph to be magnified is used in preparing the hologram so that when the magnified integral photograph is produced each elemental image of the magnified integral photograph is the same as its corresponding elemental image of the unmagnified integral photograph but the spatial arrangement of the elemental images of magnified integral photograph is reversed with respect to the corresponding elemental images of the unmagnified integral photograph~~.

8. (Currently Amended): The~~A~~ method of~~according to~~ claim 7 wherein the magnification factor is unity.

9. (Currently Amended): The~~A~~ method of~~according to~~ claim 2 for~~of~~ preparing a hologram to be used for elemental image multiplexing in a system for recording and projecting three-dimensional~~projection of~~ images, wherein

the arrangement of the elemental images of the unmagnified integral photograph is different than the arrangement of the optical arrays ~~in substantially 3-dimensional format, said method comprising the steps of:~~

~~positioning a first movable aperture in the unmultiplexed image plane so that it coincides with the position of the first elemental image of the unmultiplexed integral photograph; and,~~

~~positioning a second movable aperture in the multiplexed image plane so that it coincides with the position of the first elemental image of the multiplexed integral photograph; and,~~

~~producing the reference beam by passing diffuse coherent light from a laser through the first aperture; and,~~

~~producing the object beam by passing diffuse coherent light from the same laser through a second aperture; and,~~

~~allowing the reference and object beams to impinge upon the photographic plate for a sufficient time to expose the hologram; and,~~

~~thereafter, positioning the first movable aperture in the unmultiplexed image plane so that it coincides with the positions of the second elemental image of the unmultiplexed integral photograph, the third elemental image of the unmultiplexed integral photograph, the fourth elemental image of the unmultiplexed integral photograph, and so on, each positioning of the aperture comprising a step in the process; and,~~

~~at the same time, positioning the second movable aperture in the multiplexed image plane so that it coincides with the positions of the second elemental image of the multiplexed integral photograph, the third elemental image of the multiplexed integral photograph, the fourth elemental image of the multiplexed integral photograph, and so on, each positioning of the aperture comprising a corresponding simultaneous step in the process; and,~~

~~for each corresponding step, produce the reference and object beams and in the same manner as they were produced for the first elemental position; and,~~

~~for each corresponding step, expose the same hologram in the same manner as it was in the previous steps, making sure that both apertures always move together~~.

10. (Currently Amended): The~~A~~ method of~~according to~~ claim 9 wherein short bursts of low intensity laser radiation are used as the source of coherent light for exposure of the hologram.

11. (Canceled)

12. (Currently Amended): The~~A~~ method of~~according to~~ claim 39 for~~of~~ preparing a hologram to be used as a front projection holographic screen for reconstructing magnified 3-dimensional images projected from unmagnified integral photographs or holograms, wherein at least three monochromatic laser beams are used to prepare the hologram, such that the three wavelengths of laser light are complementary so as to produce the appearance of white light, said method comprising ~~the steps of~~:

a) optically splitting the first monochromatic laser beam into a reference beam and an object beam such that the reference beam has a spherical wavefront that appears to have been generated at an expected projection~~a reasonably large~~ distance and the object beam has a cylindrical wavefront that appears to have been generated at a distance calculated as a~~distance (~~a focal point for that wavelength[[)]]; and,

b) exposing a transparent photographic plate with ~~said monochromatic laser light such that~~ the reference beam ~~impinges on the emulsion side of the photographic plate~~ and the object beam ~~impinges on the side opposite from the emulsion~~, ~~in such a manner~~ wherein the reference beam exposes the entire plane of the photographic plate in all directions, and the object beam emanates~~results~~ from a line of light that extends across the entire photographic plate in the linear dimension at~~and~~ a focal distance [[*f*]] from the surface of the emulsion for that wavelength, said focal distance[[*f*]] being calculated based upon the distance between the

line of light and an adjacent line of light~~as the focal length from the required *(F/#)*: of the screen focusing elements~~; and,

c) repeating the previous two steps for the second monochromatic laser beam wherein~~such that~~ the line of light exposed by the object beam is adjacent to and parallel to the line of light exposed by the first monochromatic laser, and such that the two lines are not coincident; and,

d) repeating the first two steps for the third monochromatic laser beam wherein~~such that~~ the line of light exposed by the object beam is adjacent to and parallel to the line of light exposed by the second monochromatic laser, and such that it is not coincident with the line produced by either the first or second monochromatic laser; and,

e) repeating all of the above steps to ultimately ~~form~~ a plurality~~number~~ of parallel adjacent sets of three adjacent parallel lines produced by the three monochromatic laser beams ~~so~~ that ~~they may~~ repeat in groups of three across the entire photographic plate.

13. (Currently Amended): The~~A~~ method of~~according to~~ claim 12 wherein the reference and object beams both impinge on the same~~emulsion~~ side of the photographic plate.

14. (Currently Amended): The~~A~~ method of~~according to~~ claim 12~~13~~ wherein the reference and object beams both impinge on opposite sides~~side~~ of the photographic plate ~~opposite from the emulsion is non-transparent and reflective~~.

15. (Currently Amended): The~~A~~ method of~~according to~~ claim 12 wherein the object beams are repositioned optically between successive exposures of the photographic plate so as to produce parallel lines.

16. (Currently Amended): The~~A~~ method of~~according to~~ claim 12 wherein the photographic plate is repositioned mechanically between successive exposures of the photographic plate so as to produce parallel lines.

17. (Currently Amended): TheA method ofaccording to claim 12 wherein the wavelengths of the three monochromatic laser beams can be roughly characterized as red, blue and green, respectively.

18. (Currently Amended): TheA method ofaccording to claim 12 wherein the wavelengths of the three monochromatic laser beams are all components of a single laser capable of producing white coherent laser light.

19. (Currently Amended): TheA method ofaccording to claim 18 wherein the laser used is a krypton laser.

20. (Currently Amended): TheA method ofaccording to claim 18 wherein the reference beam is a spherical wavefront comprised of several or all of the wavelengths produced by the white light laser.

21. (Currently Amended): TheA method ofaccording to claim 12 wherein the distance that each real image of the line of light used in the object beam is from the photographic emulsion is computed based upon the focal length required for the particular wavelength of monochromatic light used to produce its portion of the hologram.

22. (Currently Amended): TheA method ofaccording to claim 12 wherein the hologram is comprised of holograms are produced as identical rectangular tiles, and the hologramtheater screen is produced by assembling the tiles.

23. (Currently Amended): TheA method ofaccording to claim 38 forof preparing a hologram to be used in a system for recording and projecting three-dimensionalprojection of images in substantially 3-dimensional format as a high quality holographic imaging system to transfer low abberation and low distortion images, said method comprising the steps of:

a) producing a reference beam by passing coherent light emanating from a laser through a first diffusing screen and further passing the resulting scattered coherent light through a standard projection lens that neither magnifies nor demagnifies, wherein the resulting coherent light becomes the reference beam; and,

b) producing an object beam by passing coherent light emanating from the same laser through a second diffusing screen and further passing the resulting scattered coherent light through a high quality lens system specially designed to be abberation and distortion free~~, wherein the resulting coherent light becomes the object beam~~; and,

c) exposing the photographic plate with both reference and object beams to produce the hologram.

24. (Currently Amended): The~~A~~ method of~~according to~~ claim 23 wherein the reference and object beam impinge upon opposite sides of a transparent photographic plate to expose the hologram.

25. (Currently Amended): The~~A~~ method of~~according to~~ claim 23 wherein the reference and object beam impinge upon the same side of a photographic plate to expose the hologram.

26-27 (Cancelled)

28. (Currently Amended): The~~A~~ method of~~according to~~ claim 23 wherein the hologram is produced as a reflection hologram.

29. (Currently Amended): The~~A~~ method of~~according to~~ claim 23 wherein the hologram is produced as a transmission hologram.

30. (Currently Amended): The~~A~~ method of~~according to~~ claim 38 for~~of~~ making a hologram capable of reconstructing a three-dimensional~~an~~ image ~~in substantially 3-dimensional format~~ when used with an ~~active~~ optical array~~system~~ containing a plurality of image focusing means therein, said method comprising ~~the steps of~~:

a) producing a reference beam by passing a laser beam through a standard lens ~~so as to produce the reference beam~~; and,

illuminating an integral photograph using the same laser; and,

b) producing an object beam by projecting said laser illuminated image of the integral photograph onto a diffuser plate ~~so as to produce the object beam~~; and,

c) allowing the reference and object beams to pass through an aperture or slit, and impinge together upon the surface of a

photographic film or plate for a sufficient time for photographic exposure.

31. (Currently Amended): TheA method of claim 30 for making a holographic film strip to be used in a system for recording and projecting three-dimensionalprojection of images in substantially 3-dimensional format, according to claim 30, wherein said film strip consists of successive holograms each hologram being capable of reconstructing a two[[2]]-dimensional real image of an integral photograph.

32. (Currently Amended): TheA method of claim 31 for making a holographic film strip according to claim 31 wherein the object beam is formed from anthe image of an integral photograph, such that athe three[[3]]-dimensional image that would have been produced by reconstruction of said integral photograph has no vertical parallax, thereby permitting said holographic film strip to be advanced through a projector at constant velocity.

33. (Currently Amended): TheA method ofaccording to claim 38 forof preparing a second integral photograph to be used in a system for recording and projecting three-dimensionalprojection of images in substantially 3-dimensional format, from a first integral photograph wherein said first integral photograph used together with an active optical arraysystem comprising a plurality of image focusing means therein reconstructs a three[[3]]-dimensional image that is pseudoscopic, and wherein said second integral photograph used together with an active optical arraysystem comprising a plurality of image focusing means therein reconstructs a three[[3]]-dimensional image that is orthoscopic, said method comprising the steps of:

a) reconstructing a pseudoscopic real image from the first integral photograph using a first an active optical arraysystem comprising a plurality of image focusing means therein; and,

b) photographing the pseudoscopic real image onto a photographic film or plate using an identical second active optical arraysystem

~~comprising a plurality of image focusing means therein as was used to reconstruct the pseudoscopic real image from said first integral photograph~~.

34. (Currently Amended): The~~A~~ method of~~according to~~ claim 38 for~~of~~ preparing a hologram to be used in a system for recording and projecting three-dimensional~~projection of~~ images ~~in substantially 3-dimensional format,~~ from an integral photograph wherein said integral photograph used together with an ~~active~~ optical system comprising a plurality of image focusing means therein reconstructs a three[[3]]-dimensional image that is pseudoscopic, and wherein said hologram reconstructs a three[[3]]-dimensional image that is orthoscopic, said method comprising ~~the steps of~~:

a) producing an object beam by illuminating the integral photograph with coherent radiation from a laser and~~, thereby producing an object beam by~~ reconstructing a pseudoscopic real image from said integral photograph using an active optical array~~system~~ comprising a plurality of image focusing means therein; and,

b) producing a reference beam using the same laser as was used to illuminate the integral photograph; and

c) exposing a photographic plate or film using the reference and object beams so produced.

35. (Currently Amended): The~~A~~ method of~~according to~~ claim 38 for~~of~~ preparing a second hologram to be used in a system for recording and projecting three-dimensional~~projection of~~ images ~~in substantially 3-dimensional format,~~ from a first hologram wherein said first hologram reconstructs a three[[3]]-dimensional image that is pseudoscopic, and wherein said second hologram reconstructs a three[[3]]-dimensional image that is orthoscopic, said method comprising ~~the steps of~~:

a) producing an object beam from a pseudoscopic real image reconstruction obtained by illuminating said first hologram with

coherent radiation from a laser~~, thereby producing an object beam by reconstructing a pseudoscopic real image~~; and,

b) producing a reference beam from the same laser as was used to illuminate said first hologram; and

c) exposing a photographic plate or film using the reference and object beams so produced.

36. (Currently Amended): The method of~~according to~~ claim 1 wherein ~~a coordinated and complementary set of holograms is produced whereby~~ said coordinated and complementary set of holograms is a plurality of holograms~~, once produced, is capable of accepting as its input reference beam an optical wavefront from a 3-dimensional scene and of reconstructing as its output object beam an optical wavefront from said 3-dimensional scene in magnified format such that the magnification is the same in all three dimensions~~.

37. (Currently Amended): The method of~~according to~~ claim 1 wherein said coordinated and complementary set of holograms is a single hologram ~~is produced whereby said hologram, once produced, is capable of accepting as its input reference beam an optical wavefront from a 3-dimensional scene and of reconstructing as its output object beam and optical wavefront from said 3-dimensional scene in magnified format such that the magnification is the same in all three dimensions~~.

38. (Currently Amended): The method of~~according to~~ claim 36 wherein ~~only~~ some of the elements comprising said first and second ~~active~~ optical arrays~~systems~~ are holograms, and the remaining elements are~~of said first and second active optical systems being~~ comprised of other types of optics.

39. (Currently Amended): The method of~~according to~~ claims 36, 37, or 38 wherein a hologram is prepared by exposing portions of a photographic plate incrementally until the entire hologram is produced.

40. (Currently Amended): The method of~~according to~~ claim 39 wherein movable apertures are used to expose said portions of said photographic

plate incrementally until the entire hologram is produced and are used to protect other portions of said photographic plate from being exposed.